Unforeseen complications of Sickle cell disease & its challenging management.

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Introduction

- Pericardial effusion impending cardiac tamponade & unilateral negative crystal arthropathy are rare complications of SCD that prove to be a diagnostic & therapeutic challenge.

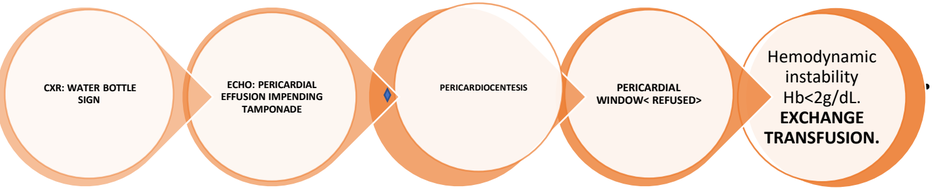
Case Discussion

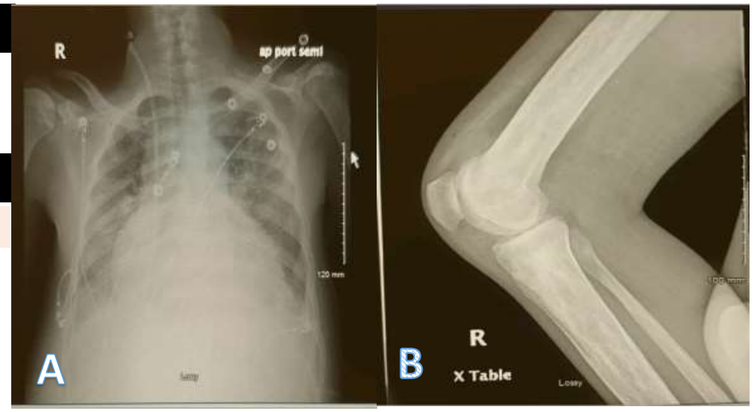
Background

- Patient was diagnosed with HbSS variant in childhood. Experienced significant recurrent episodes of sickle cell crisis & its complication; end organ damage (CKD stage 3a/A2), leg ulcers.
- Baseline Hemoglobin 5-6g/dL. On hydroxyurea 500/1000mg alternating daily. Blood transfusion was avoided due to alloimmunization, transfused only if hemodynamically unstable. Started on Aranesp (Darbepoetin Alfa) 0.4mcg/kg once every 2-weeks. Hb F 1.3%, ferritin >1500g/dL, Hb 4.1g/dL, MCV 108.2fL, retic % 16.3, LDH 685 IU/L, EPO 143 mIU/mL.
- For pain management on oxycodone due to CKD stage 3a/A2.
- Right knee negative crystal arthropathy, status post Anakinra, colchicine, & allopurinol. Still with pain & swelling.
- Right heart catherization: High output cardiac failure noted.
- On jadenu (Deferasirox) 1080mg daily for iron overload.
- Past medical & surgical history: Left inguinal lymph-node biopsy (2019).
- Family history: Mother & father have sickle cell trait.
- Social history: smokes 0.25pack/day. Denies alcohol intake.

Hospital course & transfer

- A 34-year-old male presented with leg swelling & pain, worst in right leg for 1-week.
- Evaluation included right knee X-ray significant for mild effusion. Arthrocentesis revealed leucocytosis, negative growth or crystals. F/up MRI Right knee was negative for osteomyelitis (OM). Duplex venous legs complete was negative for DVT. Orthopedic surgery advised to manage it as negative crystal arthropathy.





- ***Figure A. Chest X-ray showed enlarged cardiac silhouette; Classic Water bottle sign.***
- ***Figure B. Right Knee X-ray significant for periarticular erosions & bony infarcts .***

- CXR on admission revealed marked enlargement of cardiac silhouette. F/up CT chest revealed large pericardial effusion. ECHO revealed marked pericardial effusion impending cardiac tamponade. Underwent pericardiocentesis with >2L drained. CT surgery advised pericardial window for complete drainage, which the patient refused. Hb dropped to <2g/dL with prominent JVD. Hematology advised against blood transfusion secondary to alloimmunization. Patient had to be transferred to advanced center for Exchange transfusion.
- Simultaneously he developed AKI in setting of CKD stage 3a requiring urgent hemodialysis. ANA, ANCA, anti-GBM, complement c3-c4, vasculitis panel, SPEP was negative. Nephrology advised kidney biopsy for definitive diagnosis once the patient was stable.

Discussion

- Arthritis associated with SCD are usually symmetrical 60%, polyarticular 80%, involving large joints of lower extremity. Periarticular erosions, bony infarcts, synovitis can be seen on X-Ray. 1,2.

- Conservative management of arthritis involves analgesics, hydration, physical therapy. Followed by core decompression & eventually arthroplasty. In case of septic arthritis immediate joint debridement & irrigation should be performed. OM requires IV antibiotics. 4

- While sickle cell disease/Acute chest syndrome and pericarditis/cardiac tamponade are not associated in the current medical literature. The pathophysiology requires further investigation.
- Idiopathic pericarditis is uncommon in SCD. NSAIDs are the 1st line treatment. Pericardial effusion impending tamponade requires pericardial drain & if persistent pericardial window should be considered. 3
- Oxidative stress plays an important in complication of SCD, hence role of arginine, NSAIDs, steroids, allopurinol have been suggested. Butyrate (fatty acid) has shown increase in HbF in some studies. Inhibitors of acetone deacetylase (HDAC) have shown to decrease vascular complications of SCD. 4
- Red cell exchange transfusion is an under utilized but highly effective treatment for both chronic & acute complications of SCD by decreasing blood viscosity & increasing oxygen carrying capacity of blood. Whereas simple transfusion only improves oxygenation. 5
- Iron neutrality is maintained in red cell exchange transfusion as the removed HbS carries the major iron load. In case of volume overload, apheresis exchange transfusion can be used instead.
- Currently, bone marrow transplant is the only curative treatment available. Gene therapy has promising outcome.

Conclusion

- This case highlights the possibility of improving current & exploring advanced management options for unique complications.
- Early recognition of unique complications, appropriately timed management along with researching possibilities of new treatment options should be the focus to reduce the burden of SCD & its complications.
- Cognitive bias and lack of ongoing reassessment can be a hindrance in diagnosing the patient correctly, especially when faced with multiple rare disease processes.
- A complete effective communication during transfer of care is vital in effective management of patient with multiple rare complications.

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